RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year V, v.1 2025. | submission: 10/10/2025 | accepted: 12/10/2025 | publication: 14/10/2025

Vertical transmission of *Streptococcus Agalactiae:* a systematic review of the scientific literature

Vertical transmission of Streptococcus Agalactiae: systematic review of scientific literature

Telma Sousa Pires
Waldemar Naves do Amaral
Juliana Lamaro Cardoso
Weslley José Garcia Moreira
Bruna Sousa Rodrigues
Hemily Vivian Medeiros

Summary

This study aims to conduct a systematic review of maternal colonization with *Streptococcus agalactiae* (SGA), vertical transmission rates, and associated risk factors in different geographic and socioeconomic contexts. The literature search was conducted in PubMed/MEDLINE, Embase, and SciELO. Original studies published in peer-reviewed journals, available in full text, without time restrictions, that addressed the prevalence of maternal colonization with *Streptococcus agalactiae,* vertical transmission rates, and/or associated risk factors were included. Only studies involving pregnant women and newborns up to 90 days of age, published in English, Portuguese, or Spanish, were considered. Reviews, case reports, letters to the editor, editorials, conference proceedings, and studies using exclusively animal samples or in vitro experiments were excluded. Data were organized into tables and comparative charts, allowing for descriptive synthesis and qualitative analysis. The review identified wide variation in the prevalence of maternal colonization (4.8% to 32%) and in the vertical transmission rate (0.0% to 72.3%). The average vertical transmission rate among the included studies was approximately 21%, with 21.8% based on the simple average and 21.2% weighted by sample size, demonstrating the variable impact of prophylaxis practices and population differences. Studies with systematic intrapartum prophylaxis showed minimal transmission, while settings without universal screening showed high rates. Recurrent risk factors include premature rupture of membranes, prolonged labor, prematurity, and low maternal IgG levels. Methodological and geographic heterogeneity highlights the need for universal screening, effective prophylaxis, and continuous surveillance. Furthermore, only a small portion of the identified studies provided data on vertical transmission, highlighting a gap in the literature. In conclusion, the findings reinforce the importance of maternal screening policies, consistent implementation of intrapartum prophylaxis, and maternal immunization strategies to reduce vertical transmission of *Streptococcus agalactiae* and prevent early neonatal infections.

Keywords: *Streptococcus agalactiae.* Vertical Transmission of Infectious Disease. Pregnant women. Newborns.

Abstract

This study aimed to conduct a systematic review on maternal colonization by *Streptococcus agalactiae* (GBS), vertical transmission rates, and associated risk factors across different geographic and socioeconomic contexts. A literature search was performed in PubMed/MEDLINE, Embase, and SciELO. Original studies published in peer-reviewed journals, available in full text, without temporal restriction, addressing maternal colonization

prevalence, vertical transmission rates, and/or associated risk factors were included. Only studies involving pregnant women and newborns up to 90 days of age, published in English, Portuguese, or Spanish, were considered, while reviews, case reports, letters to the editor, editorials, conference proceedings, and studies with exclusively animal or in vitro samples were

excluded. Data were organized into comparative tables, enabling descriptive synthesis and qualitative analysis. The review identified wide variability in maternal colonization prevalence (4.8% to 32%) and vertical transmission rates (0.0% to 72.3%). The average vertical transmission rate across the included studies was approximately 21% (21.8% by simple mean; 21.2% weighted by sample size), reflecting the variable impact of prophylaxis practices and population differences. Studies with systematic intrapartum prophylaxis reported minimal transmission, whereas contexts without universal screening exhibited high rates. Recurring risk factors included premature rupture of membranes, prolonged labor, prematurity, and low maternal IgG levels. Methodological and geographic heterogeneity underscores the need for universal screening, effective prophylaxis, and continuous surveillance. Furthermore, only a small proportion of identified studies provided data on vertical transmission, highlighting a gap in the literature. In conclusion, these findings emphasize the importance of maternal screening policies, consistent implementation of intrapartum prophylaxis, and maternal immunization strategies to reduce *Streptococcus agalactiae* vertical transmission and prevent early neonatal infections.

Keywords: *Streptococcus agalactiae.* Infectious Disease Transmission, Vertical. Pregnant women. Infant, Newborn.

Introduction

Neonatal infection with *Streptococcus agalactiae,* also called Group B Streptococcus (GBS) is one of the main causes of morbidity and mortality perinatal on a global scale. It is a microorganism that, although frequently commensal in the human gastrointestinal and genitourinary tract, can become pathogenic in specific situations, especially when transmitted from mother to newborn during childbirth, a phenomenon known as vertical transmission. This route of infection, often asymptomatic during pregnancy, represents a significant challenge for health services, as it can lead to serious manifestations in newborns, such as sepsis, pneumonia and meningitis, especially in the first hours or days of life.

It is estimated that colonization of the gastrointestinal tract by GBS occurs in approximately one-third of women, with subsequent migration to the tract genitourinary, configuring an important maternal reservoir (Dadi et al., 2022; Carvalho et al., 2024; HajiAhmadi; Momtaz; Tajbakhsh, 2025). In Europe, the prevalence of colonization in pregnant women varies from 1.5% to 30%, being associated with complications obstetric conditions, such as chorioamnionitis, bacteremia and postpartum endometritis (Menichini et al., 2022). During labor, the bacteria can be transmitted ascendingly, by aspiration of contaminated fluids or by direct contact in the birth canal, which explains the high rates of neonatal colonization: between 50% and 80% of newborns carrier mothers acquire the microorganism, and approximately 1% to 2% develop symptoms serious (Alves, 2018; Rosa-Fraile; Alós, 2022).

Neonatal infection caused by GBS can be classified into two profiles main clinical features: early onset, which occurs from birth to the sixth day of life, and late onset, between the seventh and twenty-eighth day (Alshengeti, 2022). Despite approximately 98% of colonized newborns remain asymptomatic, early symptomatic form can reach an incidence of 1–3% and present rates of neonatal mortality of up to 60% (Menichini et al., 2022). Epidemiological studies also show important regional variations in the distribution of cases, reflecting biological, socioeconomic and structural factors of health systems (Gonçalves et al., 2022).

However, despite the clinical and epidemiological relevance, the scientific literature on the prevalence of maternal GBS colonization and risk factors associated with vertical transmission is still heterogeneous. Different studies use varied tracking methodologies, samples of different sizes and cutouts specific populations, making direct comparison of findings difficult. Furthermore, the available data show great variation between regions and countries, which may be related to both biological differences and socioeconomic conditions and access to health services (Larsen; Server, 2008; Yadeta et al., 2018).

It is noteworthy that the absence of a critical and systematic synthesis of the literature compromises the understanding of the real magnitude of the problem and limits the formulation of intervention strategies adapted to different epidemiological realities. Thus, it is necessary to carry out a systematic review that gathers, evaluates and compares the available evidence on the prevalence of maternal colonization by *Streptococcus agalactiae* and factors associated with vertical transmission.

In this context, this study aims to carry out a systematic review on maternal colonization by *Streptococcus agalactiae* (EGB), the rates of vertical transmission and associated risk factors in different geographic contexts and socioeconomic.

Methodology

This study is a systematic review of the scientific literature, conducted in accordance with the recommendations of the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) (Page et al., 2020). The literature search was carried out in the PubMed/MEDLINE, Embase and SciELO databases, using descriptors

controlled from MeSH and DeCS vocabularies, as well as free terms related to theme. The main descriptors used were: *Group B Streptococcus* OR *Streptococcus agalactiae; Vertical transmission* OR *Mother-to-child transmission; Pregnancy* OR *Gestation* OR *Pregnant women; Neonate* OR *Newborn; Epidemiology* OR *Prevalence.* Combinations between terms were adapted using operators boolean "AND" and "OR", in order to cover all possible intersections between the concepts of interest.

Original studies published in peer-reviewed journals were included, available in full text, without time restrictions, that address the prevalence of maternal colonization by *Streptococcus agalactiae,* the rates of vertical transmission and/or associated risk factors. Only studies with populations were considered composed of pregnant women and newborns up to 90 days old, published in the languages English, Portuguese or Spanish. Narrative reviews, systematic reviews, meta-analyses, case reports, letters to the editor, editorials, conference proceedings, as well as research with exclusively animal or experimental *in vitro samples.*

The selection of articles took place in two stages: initially, the screening of titles and abstracts, excluding those that are clearly unrelated to the topic, followed by the full reading of the texts potentially eligible for application strict adherence to inclusion and exclusion criteria. The selection process was carried out in independently by two reviewers, with any disagreements resolved by consensus.

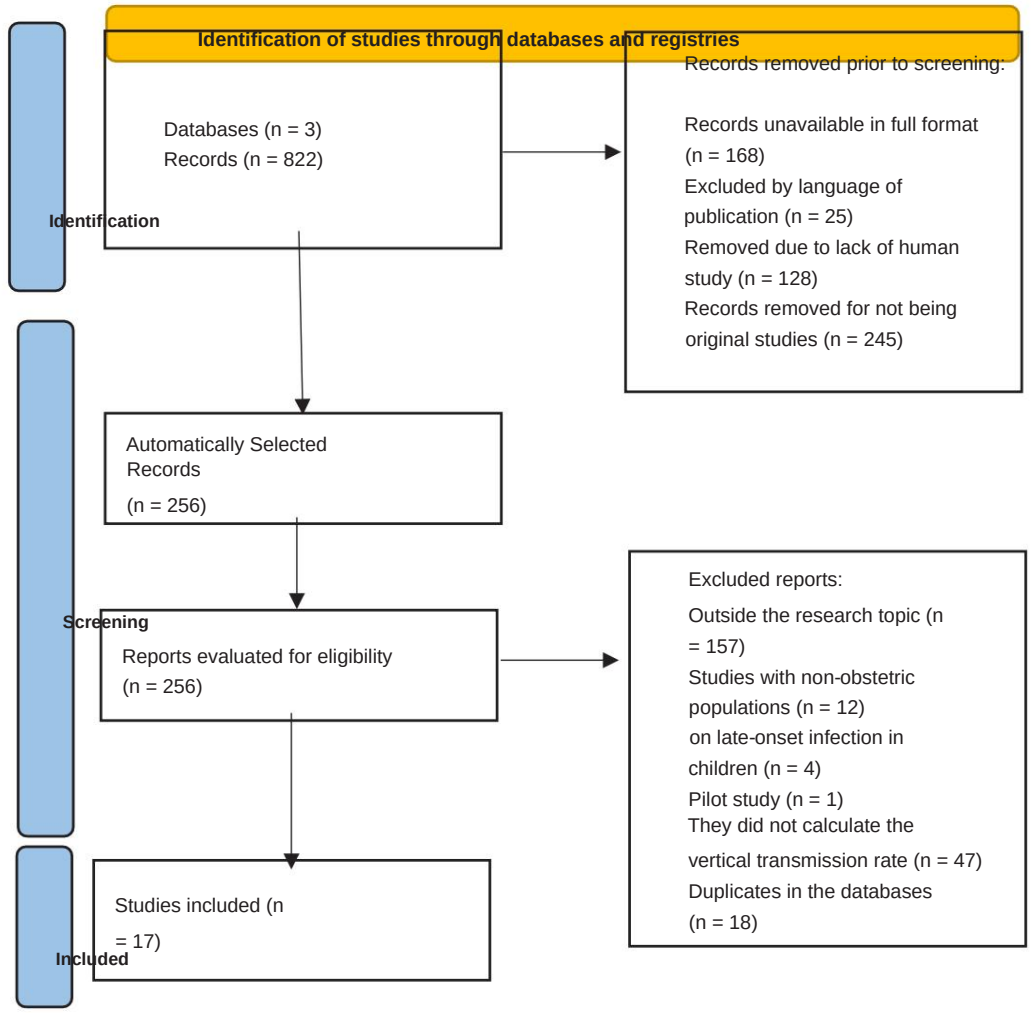
From the selected studies, information regarding author and year was extracted of publication, country of publication, characteristics of the population studied, size sample, prevalence of maternal colonization, vertical transmission rate, factors of identified risks and main conclusions. This data was organized into tables and comparative tables, enabling descriptive synthesis and qualitative analysis of the findings.

Results

The process of identification, screening and selection of studies was conducted in accordance with with the steps recommended by the PRISMA 2020 protocol (Figure 1). Initially, 822 records were found in the three databases consulted, 277 of which were in PubMed/MEDLINE, 542 in Embase and 3 in SciELO.

RCMOS - Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Figure 1 – Flowchart PRISM



Source: Prepared by the authors (2025).

In the PubMed/MEDLINE database, of the 277 studies identified, 257 were available in full format. After applying the language filters, they remained 253 publications in English, Spanish, or Portuguese. The restriction on studies with humans humans resulted in 193 records, of which 20 were original studies. Of these, 9 were excluded for not addressing the topic of interest and 9 for not bringing the rate of vertical transmission, leaving 2 studies selected for inclusion in the review.

In the SciELO database, three studies were identified, all available in text complete, published in established languages and carried out with human populations. All three were original studies and relevant to the topic, however, one of them was

identified as duplicate in relation to the other bases, and the others did not bring the rate vertical transmission, not being possible to select

In Embase, 542 records were initially located, of which 394 were available in full format. After applying the language criteria, 373 remained studies, 305 of which were conducted with human populations. Of these, 233 corresponded to original studies. Works that were not fit the theme (148), in addition to 12 carried out with non-obstetric populations, 4 on late-onset infection in children, 1 pilot study, 38 did not provide the rate of vertical transmission and 18 were duplicated in the databases. At the end of this process, 15 studies were considered eligible for review.

Adding the results from the three databases, a total of 17 studies were included in the systematic review, after exclusion of duplicates and strict application of the eligibility criteria. These studies were analyzed for their methodological characteristics, geographic context, prevalence of maternal colonization by *Streptococcus agalactiae* and factors associated with vertical transmission.

Despite the extensive survey carried out in the databases, it was observed that only a small portion of the identified studies present information on the vertical transmission rate of GBS. Of 822 total findings, 17 articles provided data consistent on this outcome, showing that most research focuses in the prevalence of maternal colonization or in other clinical aspects.

Table 1 presents a summary of the epidemiological data from the studies. selected that reported information on the prevalence of maternal colonization by *Streptococcus agalactiae* and the respective vertical transmission rates to the newborn born. Studies conducted in different geographic regions, including Africa, Asia, Europe and South America, were included, totaling large samples and diverse clinical contexts. The investigations varied in methodological design, encompassing hospital studies, observational cohorts, and multicenter analyses. This heterogeneity allows for a comprehensive view of the magnitude of the problem and the regional variations associated with maternal colonization and neonatal infection.

RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Table 1 – Epidemiological data of the included studies

Author/Year	Country	Population studied	Sample	Maternal colonization (%)	Rate of transmission vertical (%)
Ali et al., 2019	Ethiopia	Pregnant women and newborns	280	15.7	59.1
Dadi et al., Ethiopia 2022		Pregnant women and newborns	201	11.9	11.9
Gizachew et al., 2018	Ethiopia	Newborns	385	–	16.1
Guo et al., 2018	China	Newborn in maternity ward	1,814 —		1.3
Gurudas et al., 2022	India	Pregnant women and newborns	966	4.8	0.0
Kadanali et al., 2005	Türkiye	Pregnant women and newborns	150	32.0	54.2
Linhares et al., 2011	Brazil	Pregnant women	213	9.8	0.5
Musleh and Al Qahtani, 2018	Arabia Saudi Arabia	Pregnant women in labor	457	19.0	0.2
Kyohere et al., 2025	Uganda	Pregnant women and newborns	6,062	14.7	1.0/1,000 NV
Li et al., 2025	China	Pregnant and non-pregnant women pregnant women	5,858 —		3 cases neonatal/165 invasive
Seoud et al., 2010	Lebanon	Pregnant women and newborns	775/682	17.7	30.0
Serra et al., 2024	Italy	Pregnant women and newborns	2,109 / 2,144	11.4	6.06‰ (EOD confirmed)
Takahashi et al., 2021	Japan	RN (umb swab)	353	–	4.2
Tsolia et al., 2003	Greece	Pregnant women and newborns	1,014 / 428	6.6	22.5
Yadeta et al., 2018	Ethiopia	Colonized pregnant women and newborns	231	–	45.0
Joachim et al., 2009	Tanzania	Pregnant women and newborns	300	23.0	8.9
Kwatra et al., 2024	9 countries (Africa and Asia)	Pregnant women and newborns	6,514	24.1	72.3

Source: Prepared by the authors (2025).

A wide variation in the prevalence of maternal colonization was observed, ranging from 4.8% (Girija Gurudas et al., 2022, India) to 32.0% (Kadanali et al., 2005, Türkiye). This discrepancy may reflect methodological differences in sample collection, in the use of selective culture media and in the implementation of screening programs

perinatal. In general, African and low-income countries had high rates intermediate to high, such as Ethiopia (15.7% to 23%), while countries with consolidated screening and prophylaxis policies, such as Japan, Italy and India, demonstrated lower prevalence and less vertical transmission.

Regarding the vertical transmission rate, the values also presented wide range, ranging from 0.0% (Girija Gurudas et al., 2022) to 72.3% (Kwatra et al., 2022) al., 2024). Studies with high rates, such as Ali et al. (2019), Yadeta et al. (2018) and Kadanali et al. (2005), highlight the absence of intrapartum prophylaxis and prolonged rupture of membranes as determining factors. In contrast, studies that documented the routine implementation of antibiotic prophylaxis (such as Girija Gurudas et al., 2022, and Serra et al., 2024) recorded transmission rates close to zero, demonstrating the effectiveness of this intervention. These findings reinforce the correlation direct link between the adoption of preventive strategies and the reduction of early neonatal infection, in addition to pointing out the influence of socioeconomic conditions and infrastructure health in the occurrence of vertical transmission. The average vertical transmission rate among the included studies was approximately 21%, with 21.8% being the simple average and 21.2% weighted by sample size, evidencing variable impact of practices of prophylaxis and population differences.

Table 2 consolidates the risk factors identified in the studies and their main conclusions. This systematization allows us to understand the clinical elements and contextual factors associated with maternal colonization and vertical transmission of GBS, in addition to highlight persistent gaps in the adoption of preventive measures. It was observed recurring patterns that relate to both obstetric conditions (such as rupture premature rupture of membranes and prolonged labor) regarding factors structural, such as the lack of universal screening and failures in intrapartum prophylaxis.

Among the most frequently reported risk factors, rupture stands out premature rupture of membranes (PROM), prolonged labor, absence or inadequacy of intrapartum antibiotic prophylaxis (IAP), prematurity and low levels of maternal IgG antibodies specific for serotypes Ia and III. These determinants appear consistently in African studies (Ali et al., 2019; Yadeta et al., 2018; Kyohere et al., 2025) Asians (Li et al., 2025; Takahashi et al., 2021), reflecting contexts where screening is not universal or prophylaxis is difficult to implement.

Table 2 – Risk factors and main conclusions

Author/Year	Identified risk factors	Main conclusions
Ali et al., 2019	Premature rupture of membranes; absence of antibiotic prophylaxis	High prevalence and vertical transmission; need for intrapartum prophylaxis and vaccines.
Dadi et al., 2022 RPM prematurity,	prolonged, ITU, low weight	Moderate rate; recommended resistance surveillance screening.
Gizachew et al., 2018	Low maternal education; occupation; nulliparity/ multiparity	Significant neonatal colonization; reinforces intrapartum prevention.
Guo et al., 2018 —		Low neonatal prevalence; high antimicrobial resistance.
Gurudas et al., 2022	All mothers received IAP	Absence of transmission; effectiveness of intrapartum prophylaxis.
Kadanali et al., 2005	Maternal age <20 years	High prevalence of and transmission; good sensitivity antimicrobial.
Linhares et al., 2011	White skin color (protector)	Low prevalence and minimal transmission; observed resistance.
Musleh and Al Qahtani, 2018	—	Low neonatal rate; importance of screening during childbirth.
Kyohere et al., 2025	Low maternal IgG levels; lack of immunization	High neonatal mortality; reinforce immunization and systematic screening.
Li et al., 2025 high;	Resistance antimicrobial absence of universal protocol	Neonatal cases indicate persistent transmission; need for surveillance.
Seoud et al., 2010	—	High prevalence and transmission; reinforces universal screening.
Serra et al., 2024	Failure to adhere to antibiotic prophylaxis reinforces the importance of universal screening and membership of the IAP.	
Takahashi et al., 2021	Vaginal birth	Intrapartum transmission; limitations in maternal screening.
Tsolia et al., 2003	Multiparity (protector); frequent consultations ÿ colonization	Transmission rate of 22.5%; low resistance.
Yadeta et al., 2018	PROM, intrapartum fever, rupture ÿ18h ÿ risk; IAP ÿ4h ÿ risk	High transmission; low prophylaxis coverage; reinforces antenatal screening.
Joachim et al., 2009	Labor >12h	Relevant neonatal colonization; reinforce screening between 35–37 weeks.
Kwatra et al., 2024	Lack of intrapartum prophylaxis; geographic variation of serotypes	High transmission in LMICs; need for multivalent vaccines. of

Source: Prepared by the authors (2025).

In contrast, studies carried out in countries with systematic protocols of screening (Girija Gurudas et al., 2022; Serra et al., 2024) indicated the absence of vertical transmission, even in populations with moderate prevalence of colonization, confirming the effectiveness of IAP and screening between 35–37 weeks of gestation.

In general, the main conclusions of the studies converge on the need to expand universal screening, strengthen adherence to antibiotic prophylaxis and invest in maternal immunization strategies. The results also highlight the emergence of antimicrobial resistance as a growing challenge, particularly in regions of Asia and Africa, and the importance of continued epidemiological surveillance.

Finally, the comparison between the different contexts shows that effective prevention of vertical transmission of *S. agalactiae* depends on both the adoption of clinical measures standardized regarding the responsiveness of health systems.

Discussion

Analysis of the included studies reveals that maternal colonization by GBS and subsequent vertical transmission presents variability between different regions geographic, reflecting population, socioeconomic, cultural factors, and local obstetric practices. In low- and middle-income countries, especially in sub-Saharan Africa and some regions of Asia, relatively high maternal prevalence is observed high, with colonization rates ranging from 14.7% in Uganda (Kyohere et al., 2025) and 24.1% in a multicenter cohort of nine countries (Kwatra et al., 2024).

In these populations, the rate of vertical transmission is also significant, reaching 72.3% in the cohort of Kwatra et al. (2024), suggesting that the absence of intrapartum prophylaxis and limitations in antenatal screening are determining factors for the neonatal transmission. Studies conducted in Ethiopia corroborate this trend, with vertical transmissions between 11.9% and 59.1% depending on the study design and prevention strategies employed (Ali et al., 2019; Dadi et al., 2022; Yadeta et al., 2018). These findings highlight neonatal vulnerability in low-income settings. screening and prophylaxis coverage, reinforcing the need for screening policies systematic and potential maternal vaccination.

In contrast, countries with well-established intrapartum screening and prophylaxis protocols, such as India, Italy, and Japan, have lower maternal prevalence and reduced vertical transmission. Gurudas et al. (2022) observed maternal prevalence of

4.8% and absence of vertical transmission in pregnant women undergoing intrapartum prophylaxis, while Serra et al. (2024) reported only 6.06‰ cases of neonatal disease early in Italy, associated with failures in adherence to antibiotic prophylaxis. These results show that the implementation of universal screening, associated with the administration adequate use of antibiotics during labor is highly effective in preventing vertical transmission, even in populations with persistent maternal colonization.

Analysis of risk factors identified in the studies suggests that conditions obstetric, such as premature or prolonged rupture of membranes, labor prolonged and vaginal delivery, are often associated with a higher risk of transmission neonatal (Joachim et al., 2009; Takahashi et al., 2021; Yadeta et al., 2018). Furthermore, the absence or insufficiency of intrapartum prophylaxis represents one of the main determinants of neonatal infection, while appropriate antibiotic administration for ÿ4 hours has been shown to significantly reduce the risk of transmission (Yadeta et al., 2018). In some contexts, maternal factors such as young age, nulliparity, low educational level and deficiency of specific IgG antibodies to serotypes predominant (Ia and III) are also associated with greater persistence of colonization and, consequently, to vertical transmission (Kyohere et al., 2025; Plainvert et al., 2020).

With regard to microbiology and antimicrobial resistance, studies reviewed present relatively homogeneous patterns: all isolates analyzed were sensitive to penicillin and ampicillin, consolidating these agents as the first choice for intrapartum prophylaxis. However, resistance to macrolides and lincosamides varies between 6% and 23%, being a relevant aspect for patients with allergy to penicillin (Ali et al., 2019; Linhares et al., 2011; Borger et al., 2005). The predominance of specific serotypes (III, V, Ia and II) also remains consistent across different regions, although there is geographic variability and the presence of hyper-virulent clones, such as CC-17, associated with greater persistence and risk of neonatal disease (Plainvert et al., 2020; Ali et al., 2019; Kwatra et al., 2024). This serotypic heterogeneity reinforces the need to develop multivalent vaccines that cover the most common serotypes prevalent in different regions.

In methodological terms, it is important to highlight that the variation in methods of detection (conventional culture, PCR, Xpert GBS) and at collection sites (vaginal, rectal, umbilical, oropharyngeal) contributes to differences in prevalence estimates and transmission. Studies that used more sensitive molecular techniques, such as PCR or qPCR, reported higher rates of maternal and neonatal colonization compared with

traditional culture (Vieira et al., 2019; Gerolymatos et al., 2018). Furthermore, the use of combined swabs from multiple sites increased the detection of maternal colonization, highlighting the relevance of standardized protocols for antenatal screening (Marconi et al., 2010).

Taken together, the results of this review suggest that the maternal prevalence of EGB and vertical transmission rate are significantly influenced by quality antenatal screening, adherence to intrapartum prophylaxis and individual obstetric factors. Low- and middle-income countries are more vulnerable, reflecting gaps in screening and prevention policies, while nations with consolidated protocols demonstrate effectiveness in reducing transmission. Serotypic variability and the presence of hyper-virulent clones reinforce the need for continued surveillance, studies of antimicrobial resistance and development of adapted preventive strategies regionally, including maternal vaccination programs that can reduce incidence of early neonatal disease.

Conclusion

The review of studies shows that maternal colonization by GBS and vertical transmission to the newborn represents a significant health challenge perinatal in different geographic contexts. It is observed that maternal prevalence and vertical transmission rates vary significantly between low, medium and high income countries income, reflecting differences in antenatal screening policies, adherence to prophylaxis intrapartum and individual obstetric factors.

Low- and middle-income countries, especially in sub-Saharan Africa and some regions of Asia, have high rates of maternal colonization and transmission vertical, often associated with the lack of systematic screening and coverage insufficient antibiotics during labor. On the other hand, in countries with consolidated intrapartum screening and prophylaxis protocols, such as India, Italy, and Japan, low maternal prevalence and reduced vertical transmission are observed, highlighting the effectiveness of well-implemented preventive strategies.

Furthermore, analysis of risk factors indicates that obstetric conditions such as premature or prolonged rupture of membranes, prolonged labor and delivery vaginal are associated with a higher risk of neonatal transmission, while prophylaxis adequate intrapartum survival represents an effective protection mechanism. The presence of clones

hypervirulent, such as CC-17, and serotypic variability between different regions reinforce the need for continuous surveillance, monitoring of resistance antimicrobial and development of regionally adapted multivalent vaccines.

Therefore, the findings of this review reinforce the importance of implementing universal screening for GBS during pregnancy, the effective use of intrapartum prophylaxis and the strengthening regional preventive strategies, including potential programs maternal vaccination. The combination of these measures can significantly reduce neonatal colonization, prevent early neonatal disease and reduce morbidity and mortality associated with GBS infection, promoting better maternal and neonatal outcomes.

An obvious limitation of this review is the scarcity of studies reporting the rate of vertical transmission of GBS. This gap in the literature highlights the need for future research that systematically addresses this outcome, which is fundamental for the prevention of neonatal infections.

References

ALI, Musa Mohammed et al. Prevalence of group B streptococcus among pregnant women and newborns at Hawassa University comprehensive specialized hospital, Hawassa, Ethiopia. *BMC Infectious Diseases,* v. 19, no. 1, p. 325, 2019.

ALSHENGETI, Amer. Group B Streptococcus among pregnant women and neonates in Saudi Arabia: a systemic review. *Pathogens,* vol. 11, no. 9, p. 1029, 2022.

ALVES, E. Molecular determination of capsular serotypes and antimicrobial susceptibility profile in *Streptococcus agalactiae* isolated from patients treated at the University Hospital/UFSC in the city of Florianópolis/SC. 2018. Dissertation (Master's in Pharmacy) – Federal University of Santa Catarina, Florianópolis, 2018.

CARVALHO, Anjo Gabriel et al. Prevalence and susceptibility profile of colonization by Group B *Streptococcus* in pregnant women in the Brazilian Amazon. *Brazilian Journal of Maternal and Child Health,* v. 24, p. e20230063, 2024.

DADI, Belayneh Regasa et al. Vertical transmission, risk factors, and antimicrobial resistance patterns of group B *Streptococcus* among mothers and their neonates in southern Ethiopia. *Canadian Journal of Infectious Diseases and Medical Microbiology,* vol. 2022, no. 1, p. 8163396, 2022.

GIZACHEW, Mucheye et al. Newborn colonization and antibiotic susceptibility patterns of *Streptococcus agalactiae* at the University of Gondar Referral Hospital, Northwest Ethiopia. *BMC Pediatrics,* vol. 18, no. 1, p. 378, 2018.

GONÇALVES, Bronner P. et al. Group B *streptococcus* infection during pregnancy and infancy: estimates of regional and global burden. *The Lancet Global Health,* vol. 10, no. 6, p. e807–e819, 2022.

GUO, Dan et al. Neonatal colonization of group B *Streptococcus* in China: prevalence, antimicrobial resistance, serotypes, and molecular characterization. *American Journal of Infection Control,* vol. 46, no. 3, p. e19–e24, 2018.

GURUDAS, Girija et al. Prevalence of Group B *Streptococcus* in pregnant women in Kerala and relation to neonatal outcomes: a prospective cross-sectional study. *Journal of Tropical Pediatrics,* vol. 68, no. 6, p. fmac092, 2022.

HAJIAHMADI, Pegah; MOMTAZ, Hassan; TAJBAKHSH, Elahe. Molecular characterization of *Streptococcus agalactiae* strains isolated from pregnant women. *Scientific Reports,* vol. 15, no. 1, p. 5887, 2025.

JOACHIM, Agricola et al. Maternal and neonatal colonization of group B *streptococcus* at Muhimbili National Hospital in Dar es Salaam, Tanzania: prevalence, risk factors and antimicrobial resistance. *BMC Public Health,* vol. 9, no. 1, p. 437, 2009.

KADANALI, A.; ALTOPARLAK, Ü.; KADANALI, S. Maternal carriage and neonatal colonization of group B *streptococcus* in eastern Turkey: prevalence, risk factors and antimicrobial resistance. *International Journal of Clinical Practice,* vol. 59, no. 4, p. 437–440, 2005.

KWATRA, Gaurav et al. Prevalence of group B *Streptococcus* colonization in mother–newborn babies in low-income and middle-income south Asian and African countries: a prospective, observational study. *The Lancet Microbe,* vol. 5, no. 10, 2024.

KYOHERE, Mary et al. Epidemiology of Group B *Streptococcus:* Maternal colonization and infant disease in Kampala, Uganda. In: *Open Forum Infectious Diseases.* Oxford: Oxford University Press, 2025. p. ofaf167.

LARSEN, John W.; SEVER, John L. Group B *Streptococcus* and pregnancy: a review. *American Journal of Obstetrics and Gynecology,* vol. 198, no. 4, p. 440–450, 2008.

LI, Yingxing et al. The increasing burden of group B *Streptococcus* from 2013 to 2023: a retrospective cohort study in Beijing, China. *Microbiology Spectrum,* vol. 13, no. 1, p. e02266–24, 2025.

LINHARES, José Juvenal et al. Prevalence of *Streptococcus agalactiae* colonization in pregnant women treated at a maternity hospital in Ceará, Brazil, correlating with perinatal outcomes. *Brazilian Journal of Gynecology and Obstetrics,* v. 33, p. 395–400, 2011.

MENICHINI, Daniela et al. Supplementation of probiotics in pregnant women targeting group B *streptococcus* colonization: a systematic review and meta-analysis. *Nutrients,* vol. 14, no. 21, p. 4520, 2022.

MUSLEH, Jehan; AL QAHTANI, Nourah. Group B *Streptococcus* colonization among Saudi women during labor. *Saudi Journal of Medicine & Medical Sciences,* vol. 6, no. 1, p. 18–22, 2018.

ROSA-FRAILE, Manuel; ALOS, Juan-Ignacio. Group B *Streptococcus* neonatal infections, the ongoing history. *Infectious Diseases and Clinical Microbiology (English ed.),* v. 40, no. 7, p. 349–352, 2022.

SEOUD, Muheiddine et al. Prenatal and neonatal Group B *Streptococcus* screening and serotyping in Lebanon: incidence and implications. *Acta Obstetricia et Gynecologica Scandinavica,* v. 89, no. 3, p. 399–403, 2010.

SERRA, Gregorio et al. Group B *streptococcus* colonization in pregnancy and neonatal outcomes: a three-year monocentric retrospective study during and after the COVID-19 pandemic. *Italian Journal of Pediatrics,* vol. 50, no. 1, p. 175, 2024.

TAKAHASHI, Keigo; SATO, Yuka; IKEDA, Kazushige. Group B *streptococcus* neonatal umbilical colonization managed by dry cord care in nurses: a retrospective cohort study. *Pediatrics & Neonatology,* vol. 62, no. 5, p. 506–511, 2021.

TSOLIA, M. et al. Group B *streptococcus* colonization of Greek pregnant women and neonates: prevalence, risk factors and serotypes. *Clinical Microbiology and Infection,* vol. 9, no. 8, p. 832–838, 2003.

YADETA, Tesfaye Assebe et al. Vertical transmission of group B *Streptococcus* and associated factors among pregnant women: a cross-sectional study, Eastern Ethiopia. *Infection and Drug Resistance,* p. 397–404, 2018.